

Sec 6

Neural

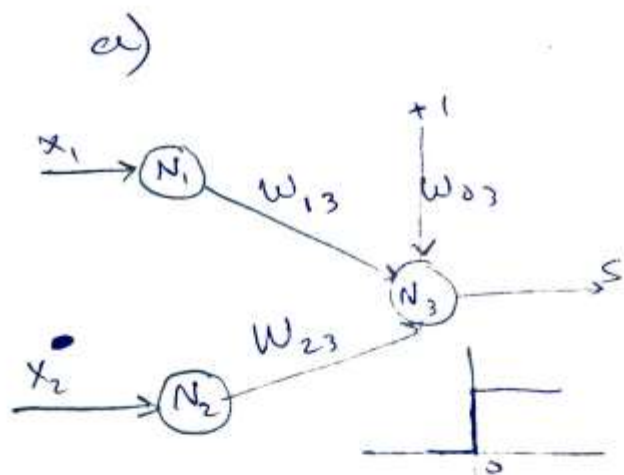
7) Design $x_1 + \hat{x}_2$

a) weights

b) eqn. of separation line

c) $(0, 1)$, $(1, 0)$, $(1, 1)$

d) $(0.5, 0.5)$, $(0.5, 1.5)$, $(0, -0.5)$



x_1	x_2	\hat{x}_2	$x_1 + \hat{x}_2$
0	0	1	1
0	1	0	0
1	0	1	1
1	1	0	1

$$y = w_{13}x_1 + w_{23}x_2 + w_{03}$$

1) $x_1 = x_2 = 0$

$$y = w_{03} \quad s = 1 \rightarrow w_{03} \geq 0$$

2) $x_1 = 0 \quad x_2 = 1$

$$y = w_{23} + w_{03}$$

$$s = 0$$

$$w_{23} + w_{03} < 0$$

□

$$3) X_1 = 1 \quad X_2 = 0$$

$$y = w_{13} + w_{03} > 0 \quad s = 1$$

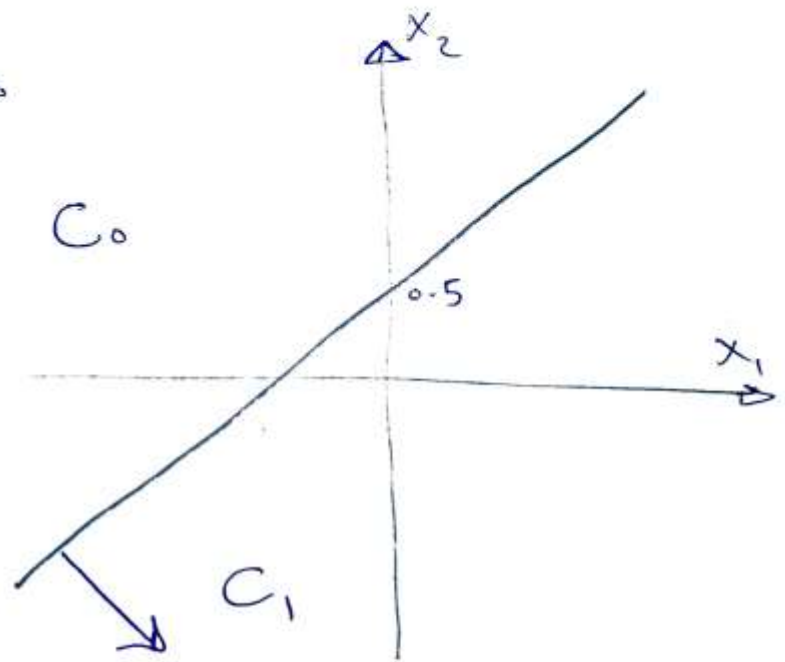
$$4) X_1 = 1 \quad X_2 = 1$$

$$y = w_{13} + w_{23} + w_{03} > 0 \quad s = 1$$

لنفترض قيم w_{03} , w_{13} , w_{23} بشرط ان تحقق الشروط

Let $w_{03} = 0.5$, $w_{13} = 1$, $w_{23} = -1$

$$b) X_1 - X_2 + 0.5 = 0$$



$$c) (0, 1) \rightarrow C_0 \quad \& \quad (1, 0) \rightarrow C_1 \quad \& \quad (1, 1) \rightarrow C_1$$

له ممكنة تقصيص بجدول.

x_1, x_2	$x_1 - x_2 + 0.5$	S	C_0 / C_1
$(0, 1)$	$-0.5 < 0$	0	C_0
$(0.5, 0.5)$	$0.5 \geq 0$	1	C_1
$(0, 0.5)$	$1 \geq 0$	1	C_1

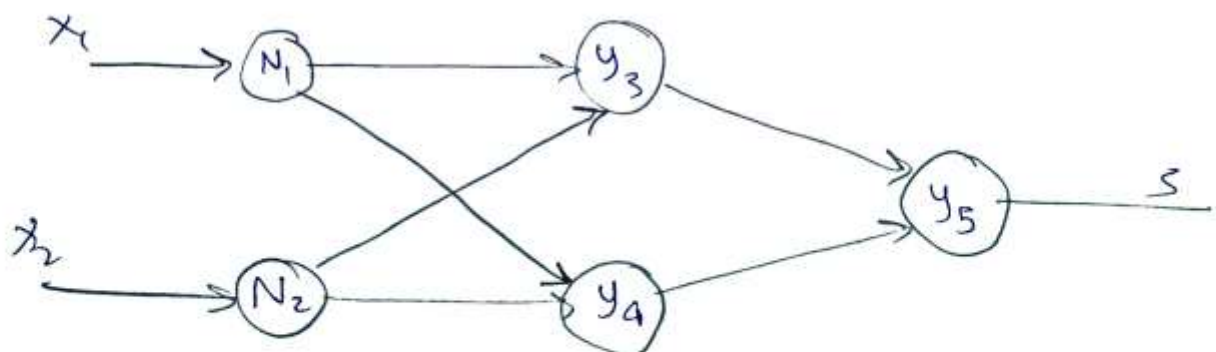
16) XNOR

a) $w_{13} = 1$ $w_{23} = 1$ $w_{03} = -1.5$
 $w_{14} = 1$ $w_{24} = -1$ $w_{04} = 0.5$
 ~~$w_{35} = 1$~~ $w_{45} = 1$ $w_{05} = -0.5$

b) eqn.

c, d. $((0, 0), (0, 1), (1, 1))$
 $(1, -1) \quad (-1, 1)$
 $(0.5, 0.7)$

binary threshold



$$y_3 \leq x_1 + x_2 - 1.5 \rightarrow (1)$$

$$y_4 \leq -x_1 - x_2 + 0.5 \rightarrow (2)$$

$$y_5 \leq f(y_4) + f(y_3) - 0.5$$

x_1	x_2	y_3	$f(y_3)$	y_4	$f(y_4)$	y_5	s	C_0/C_1
0	0	-1.5	0	0.5	1	0.5	1	C_1
0	1	-0.5	0	-0.5	0	-0.5	0	C_0
1	0	-0.5	0	-0.5	0	-0.5	0	C_0
1	1	0.5	1	-1.5	0	0.5	1	C_1

↓
And

↓
No R

↓
OR

Solve (1) & (2)

